

# **Southeast Colorado Watershed Management Unit Water Quality Assessment Report**



**Division of Water Quality  
Department of Environmental Quality**

# **Southeast Colorado Watershed Management Water Quality Assessment Report**

**December  
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**Department of Environmental Quality  
Division of Water Quality  
Salt Lake City, Utah**

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## EXECUTIVE SUMMARY

In July of 1997, the Division of Water Quality (DWQ) began an intensive water quality monitoring project to assess the quality of waters in the Southeastern part of Utah. This area was designated by the Division as the Southeast Colorado Watershed Management Unit. Samples were collected from 27 sampling sites and analyzed to assess the water quality of streams in the management unit. Twenty-five sites were monitored by the Utah Division of Water Quality (DWQ) on an intensive basis from July 1997 through June 1998. Samples were collected once a month except during spring runoff in 1998. Samples were collected twice a month during this time. No samples were collected in December. The U.S. Bureau of Land Management collected samples at 3 stream sites. Additional data were collected at these sites after the completion of the intensive survey. Canyonlands National Park personnel collected samples at two sites on the Colorado River.

Streams were assessed against State water quality standards and pollution indicators to determine if their designated beneficial uses were being met. The streams in the Southeast Watershed Management Unit are classified as one of the following or a combination of the following beneficial use classifications: protected as a source of drinking water (1C), contact recreation (2B), cold water game fish (3A), warm water game fish (3B), non-game fish and other aquatic life (3C), and agricultural use including irrigation and stock watering (4).

There are an estimated 981 perennial stream miles within the Southeast Colorado Watershed Management Unit. An assessment of support of all beneficial uses except Class 2B (contact recreation) was made for 606 miles (61.8%). Of those assessed, 447 miles (73.8%) were assessed as fully supporting all their beneficial uses, 44 miles (7.3%) were assessed as partially supporting, 115 miles (18.9%) were assessed as not supporting at least one designated beneficial use. The table below lists beneficial use support under the individual beneficial use designations.

<b>Individual Beneficial Use Support Summary</b> <b>Southeast Colorado Watershed Management Unit</b> <b>(Stream Miles)</b>							
<b>Goals<sup>a</sup></b>	<b>Use</b>	<b>Size Assessed</b>	<b>Size Fully Supporting</b>	<b>Size Fully Supporting but Threatened</b>	<b>Size Partially Supporting</b>	<b>Size Not Supporting</b>	<b>Size Not Attainable</b>
Protect & Enhance Ecosystems	Aquatic Life	605.8	506.3	0.0	42.6	56.9	0.0
Protect & Enhance Public Health	Fish Consumption	0.0	0.0	0.0	0.0	0.0	0.0
	Swimming <sup>b</sup>	0.0	0.0	0.0	0.0	0.0	0.0
	Secondary Contact	0.0	0.0	0.0	0.0	0.0	0.0
	Drinking Water <sup>c</sup>	310.4	276.7	0.0	16.6	17.1	0.0

<b>Individual Beneficial Use Support Summary</b> <b>Southeast Colorado Watershed Management Unit</b> <b>(Stream Miles)</b>							
<b>Goals<sup>a</sup></b>	<b>Use</b>	<b>Size Assessed</b>	<b>Size Fully Supporting</b>	<b>Size Fully Supporting but Threatened</b>	<b>Size Partially Supporting</b>	<b>Size Not Supporting</b>	<b>Size Not Attainable</b>
Social and Economic	Agricultural	605.8	446.8	0.0	44.3	114.7	0.0

<sup>a</sup> These goals are part of the national water quality goals adopted by the EPA Office of Water and the ITFM in their Environmental Goals and Indicators effort.

<sup>b</sup> Class 2B (secondary contact) streams were evaluated as swimmable for purposes of the CWA goals, therefore the swimming and secondary contact classification categories are the same.

The major cause of water quality impairment was total dissolved solids (TDS) that exceeded the State's agricultural (Class 4) standard of 1,200 mg/l. The probable sources for TDS were natural and agricultural practices that tend to increase the amount of TDS in streams in this area. Other causes of stream impairment were high temperatures, pH violations, and gross alpha violations in the Cottonwood was area. The gross alpha violations were a result of historical resource extraction and abandoned tailings in the area. The source of the pH violations is unknown.

The upper and lower sections of the Paria River were listed as not supporting the agricultural beneficial use classification (Class 4) because of high concentrations of total dissolved solids. Johnson Creek, Indian Creek and North Creek were assessed as having pH problems. The source of the problem is unknown. Mill Creek, Onion Creek and Castle Creek all had TDS violations and Onion Creek along with Mill Creek had temperatures that exceeded the temperature standards for aquatic life. The Dolores River and LaSal Creek were assessed as fully supporting the their beneficial uses.



## Southeast Colorado Watershed Management Unit Stream Water Quality Assessment

### Introduction

The Southeast Colorado Watershed Management Unit includes all streams located in the U.S.G.S Hydrological Units (HUCs) listed in Table 1. Some of the major streams are the San Juan River, Dolores River, Mill Creek, Montezuma Creek, LaSal Creek, Geyser Creek and part of the Colorado River.

Table 1. Hydrological Unit Codes and Names	
Hydrological Unit Code	Hydrological Unit Name
14010005	Colorado Headwaters/Plateau Utah
14030001	Westwater Canyon
14030002	Upper Dolores
14030004	Lower Dolores
14030005	Upper Colorado-Kane Springs
14070006	Lower Lake Powell
14070007	Paria
14080201	Lower San Juan-Four Corners Southeast
14080202	McElmo
14080203	Montezuma
14080204	Chinle
14080205	Lower San Juan

### Materials and Methods

**Field and Laboratory Methods**—Data collected from 27 sampling sites were used to assess the water quality of streams in the management unit. Twenty-five sites were monitored by the Utah Division of Water Quality (DWQ) on an intensive basis from July 1997 through June 1998. Samples were collected once a month except during spring runoff in 1998. Samples were collected twice a month during this time. No samples were collected in December. The U.S. Bureau of Land Management collected samples at 3 stream sites. Additional data were collected at these sites after the completion of the intensive survey. Canyonlands National Park personnel collected samples at two sites on the Colorado River. The samples were sent to the State Health Lab for processing.

For the intensive monitoring, oxygen, pH, water temperature, and conductivity were measured *in situ* using a Hydrolab. Instantaneous flows were measured using a Marsh-McBurney flow meter during each survey unless the station was located at or near a U.S. Geological Survey (U.S.G.S.) gaging station. Flow data for these stations will be obtained from the U.S.G.S. as needed. Water quality samples were collected according to standard field procedures defined and adopted by the Division of Water Quality in 1993 (DWQ, 1993). Chemical analysis in the laboratory included ammonia, total phosphorus, dissolved nitrate-nitrite, dissolved total phosphorus, total suspended solids, total dissolved solids, dissolved calcium, dissolved magnesium, dissolved potassium, dissolved sodium chloride concentration, sulfate, alkalinity and hardness. Turbidity was also determined in the laboratory. Concentrations for the following dissolved metals were determined: arsenic, barium, cadmium, chromium, copper, iron, lead, selenium, silver, zinc, and mercury.

Table 2 lists the waterbodies and the sampling sites (STORET Numbers) that were used to assess beneficial use support. The waterbodies identified as ‘areas of undefined waterbodies’ were large areas containing intermittent and ephemeral streams.

Beneficial use assessments were made based upon the methodology listed in Appendix A. Water chemistry data were compared against Utah’s standards listed in ‘**Standards of Quality for Waters of the State**’, R317-2, **Utah Administrative Code**, (DWQ, 1999) to determine if the beneficial use designations for were being supported (Figure 2). Waters that had elevated levels of total phosphorus and were not listed on the 303(d) list were identified as needing further study.

## Results

**Beneficial Use Assessment**--There are an estimated 981 perennial stream miles within the Southeast Colorado Watershed Management Unit. An assessment of support of all beneficial uses except Class 2B (contact recreation) was made for 606 miles (61.8%) Of those assessed, 447 miles (73.8%) were assessed as fully supporting all their beneficial uses, 44 miles (7.3%) were assessed as partially supporting, 115 miles (18.9%) were assessed as not supporting at least one designated beneficial use. The overall beneficial use assessment is shown below in Figure 1.

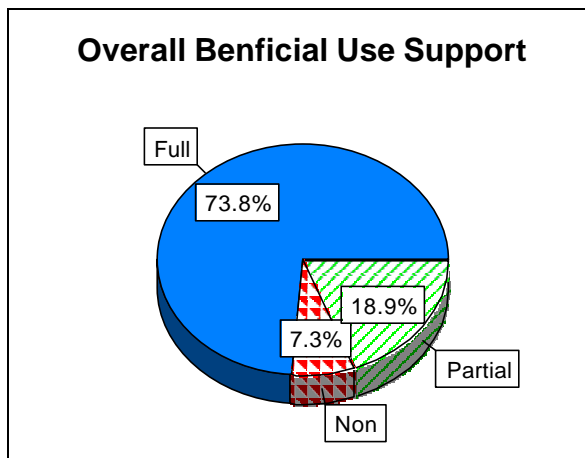


Figure 1. Overall beneficial use support excluding Class 2B waters in Southeast Colorado Unit.

Table 3 lists the beneficial use support by individual categories. Six-hundred six (606) stream miles were assessed for aquatic life and agricultural use support. This was 61.8% of the estimated stream miles that were classified for these two beneficial uses.

Of the streams assessed for aquatic life, 506.3 miles (83.6%) were assessed as fully supporting, 42.6 miles (4%) not supporting this beneficial use.

Of the streams assessed for agricultural use, 464 miles (76.6%) were assessed as fully supporting, 44.3 miles (7.3%) partially supporting, and 97.6 miles (16.1%) not

supporting this beneficial use.

There were an estimated 520 miles classified as Class 1C waters (source of drinking water). Three-hundred ten (310) miles (59.7%) were assessed. Of these, 276.7 miles (89.1%) were assessed as fully supporting, 16.6 miles (5.4%) were partially supporting, and 17.1 miles (5.5%) were assessed as not supporting this beneficial use.

Those stream segments that were determined not to be supporting at least one of their designated beneficial uses are called '**water quality limited segments**' and can be placed on a list called the '**303(d) list of impaired waters**'. This list is submitted to EPA every two years and identifies those waters that are not meeting water quality standards or are assessed as not fully supporting one or more of their designated beneficial uses.

Figure 3 identifies the waterbodies and the sampling sites used to assess beneficial use support. Figure 4 shows the overall beneficial use support for the waterbody segments excluding the Class 2B category.

Table 4 lists the stream waterbodies that were assessed as impaired, the hydrological unit they are located in and the cause(s) and source(s) of impairment.

Six waterbodies comprising 140 stream miles were assessed as needing further study for Class 3A or 3B waters due to elevated levels of phosphorus (Figure 6, Table 5).

Tables 6 and 7 list the miles of streams affected by the various cause and source categories identified as generally affecting water quality.

Figure 7 illustrates the percent of stream miles affected by various causes of pollution.

3



Figure 8 shows the relative percent of stream miles effected by various causes of water quality impairment. The causes of impairment included total dissolved solids, pH, temperature, and gross alpha. The percent of stream miles affected by various sources is shown in Figure 8. The relative impact of each source is shown in Figure 9. The major sources of impairment were agricultural activities and natural sources. Resource extraction from uranium mining was the source of gross alpha. The source of the pH problem in several streams was not known.

**Colorado River**–The Colorado River was assessed as fully supporting all of its beneficial uses. The Class 2B (contact recreation) beneficial use was not assessed using bacteriological data, therefore it was listed as not being assessed for that use.

**San Juan River**–The two segments of the San Juan River that were assessed were found to be supporting their beneficial uses. The lower segment, from Lake Powell to the HUC unit boundary was assessed as having elevated levels of total phosphorus and will be listed as a water that needs further study. That portion of the San Juan River that is entirely within the boundaries of the Navajo Indian Reservation was not assessed although there was data collected for this site. The Navajo Indian Nation requested that Utah not list any waters that were within their reservation boundaries as being assessed or placed on the State’s 303(d) list because they were in the process of having their water quality program approved by EPA. As such, the waters within their boundaries would fall under their jurisdiction. The State agreed with their request and did not assess or list that portion of the San Juan River or McElmo Creek on the 303(d) list. For those waters, where the waterbodies are contiguous with both tribal lands and state or federal lands, either group can choose to list the water on their respective 303(d) lists.

**Paria River**–The upper and lower sections of the Paria River were listed as not supporting the agricultural beneficial use classification because of high concentrations of total dissolved solids.

**Cottonwood Wash**–This areas was assessed as not supporting its 1C (source of drinking water) classification because violations of the standard for gross alpha. The source of the pollution is historical mining and mine tailings in the area.

**Johnson Creek, Indian Creek and North Creek** were placed on the 303(d) list because of pH problems. The source of the problem is unknown. In addition, Onion Creek also has temperature and TDS problems.

**Mill Creek and Onion Creek** had temperature and TDS violations.

**Castle Creek** had elevated levels to total dissolved solids (TDS).

**Dolores River**–The Dolores River and its tributaries were assessed as fully supporting all of the beneficial uses that it was assessed for.

**LaSal Creek**–This stream was also assessed as fully supporting its beneficial uses.

**Elevated Levels of Total Phosphorus**–Portions of the San Juan River, Montezuma Creek, Indian Creek, Mill Creek, Castle Creek and Onion Creek had elevated levels of phosphorus and were listed as waters that need to be looked at more closely to determine if there are water quality impairments (Table 5, Figure 5). Total phosphorus does not cause impairment directly, but may provide enough nutrients for nuisance algal blooms that can cause taste and odor problems in drinking water or can cause the concentration of dissolved oxygen to decrease to the level that fish kills may occur.

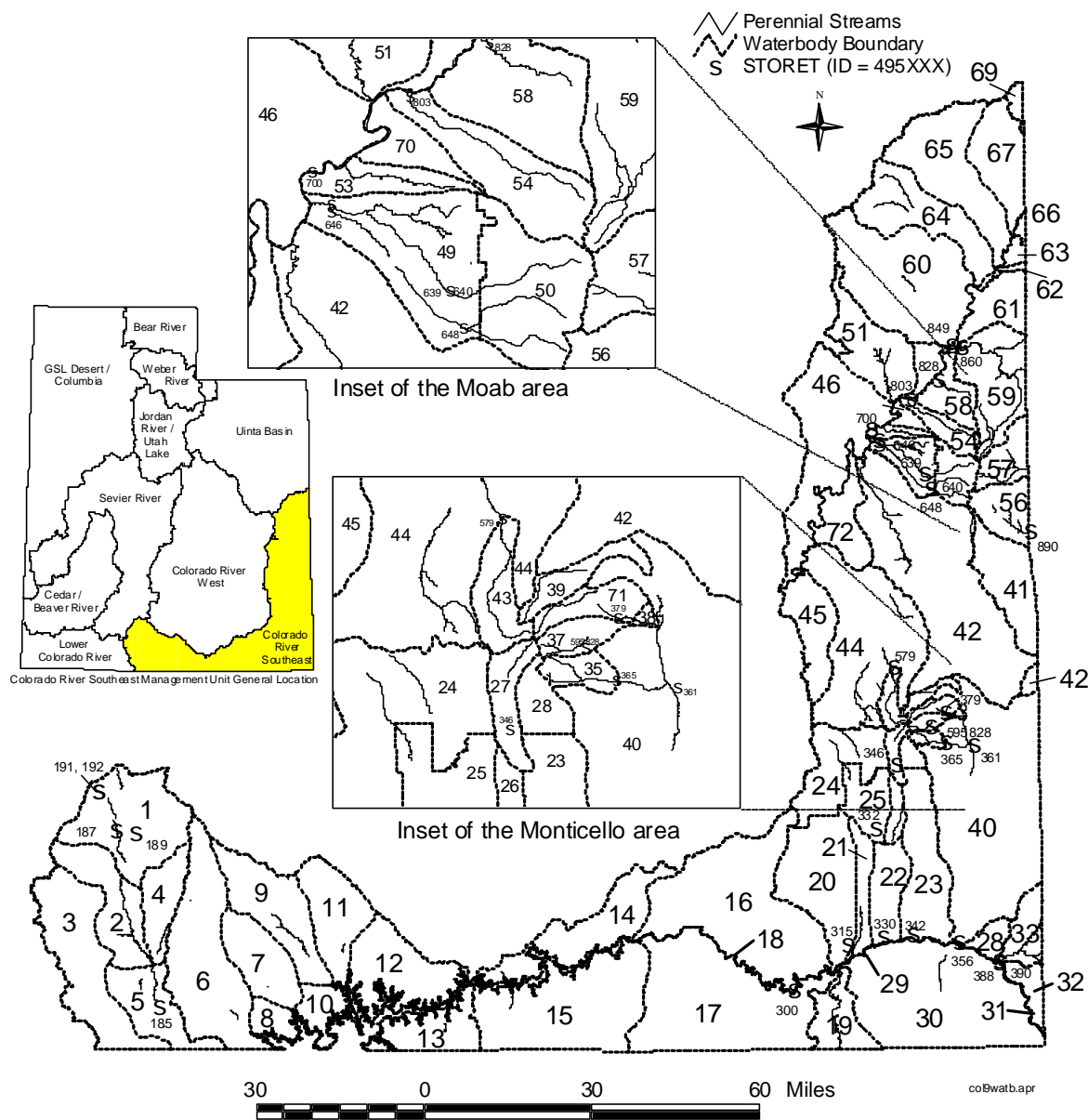
<b>Table 2. Southeast Colorado Watershed Management Unit Sampling Sites.</b>					
<b>WB</b>	<b>STORET</b>	<b>Waterbody</b>	<b>WB</b>	<b>STORET</b>	<b>Waterbody</b>
<b>No.</b>	<b>Number</b>	<b>Name</b>	<b>No.</b>	<b>Number</b>	<b>Name</b>
1	495187	Paria River-1	37		South Creek
2	599455	Paria River-2	38	495361	Monetezuma Creek-1
3		Buckskin Gulch	39		Spring Creek
4		Cottonwood Creek	40	495356	Montezuma Creek-3
5	495185	Paria River-3	41		
6		Wahweap Creek	42		Kane Spring Wash
7		Warm Creek	43	495579	Indian Creek-2
8		Lake Powell Tribs-1	44		
9		Chance Creek	45		
10		Lake Powell Tribs-2	46		
11		Croton	47	495700 495625	Colorado River-3
12		Lake Powell Tribs-3	48	495700 495625	Colorado River-4
13		Lake Powell Tribs-4	49	495639 495646	Mill Creek-1
14			50	495640	Mill Creek-2
15			51	495803	Salt Wash
16			52		
17			53		Negro Bill
18	495300	San Juan River-1	54	495803	Castle Creek
19		Chinle Creek	55	495828	Onion Creek
20	495315		56	495890	LaSal Creek
21		Butler Wash	57		Roc Creek
22	495330	Cottonwood Wash-1	58		
23	495342	Recapture Creek-1	59	495860	Delores River
24		Cottonwood Wash-3	60		
25	495332	Cottonwood Wash-2	61		
26		Westwater Creek	62		Little Delores River
27	495346	Johnson Creek	63		
28		Recapture Creek-2	64		Cottonwood Wash
29	495300	San Juan River-2	65		Westwater Creek
30			66		Colorado River-6
31	495390	San Juan River-3	67		Bitter Creek
32			68	495849	Colorado River-5
33	495388	McElmo Creek	69		
34	495361	Verdure Creek-1	70		
35	495365	Verdure Creek-2	71	495379	North Creek
36	495361	Montezuma Creek-2			

Table 3. Individual Beneficial Use Support Summary Southeast Colorado Watershed Management Unit							
Goals <sup>a</sup>	Use	Size Assessed	Size Fully Supporting	Size Fully Supporting but Threatened	Size Partially Supporting	Size Not Supporting	Size Not Attainable
Protect & Enhance Ecosystems	Aquatic Life	605.8	506.3	0.0	42.6	56.9	0.0
Protect & Enhance Public Health	Fish Consumption	0.0	0.0	0.0	0.0	0.0	0.0
	Swimming <sup>b</sup>	0.0	0.0	0.0	0.0	0.0	0.0
	Secondary Contact	0.0	0.0	0.0	0.0	0.0	0.0
	Drinking Water <sup>c</sup>	310.4	276.7	0.0	16.6	17.1	0.0
Social and Economic	Agricultural	605.8	446.8	0.0	44.3	114.7	0.0

<sup>a</sup> These goals are part of the national water quality goals adopted by the EPA Office of Water and the ITFM in their Environmental Goals and Indicators effort.

<sup>b</sup> Class 2B (secondary contact) streams were evaluated as swimmable for purposes of the CWA goals, therefore the swimming and secondary contact classification categories are the same.

## SOUTHEAST COLORADO WATERBODIES

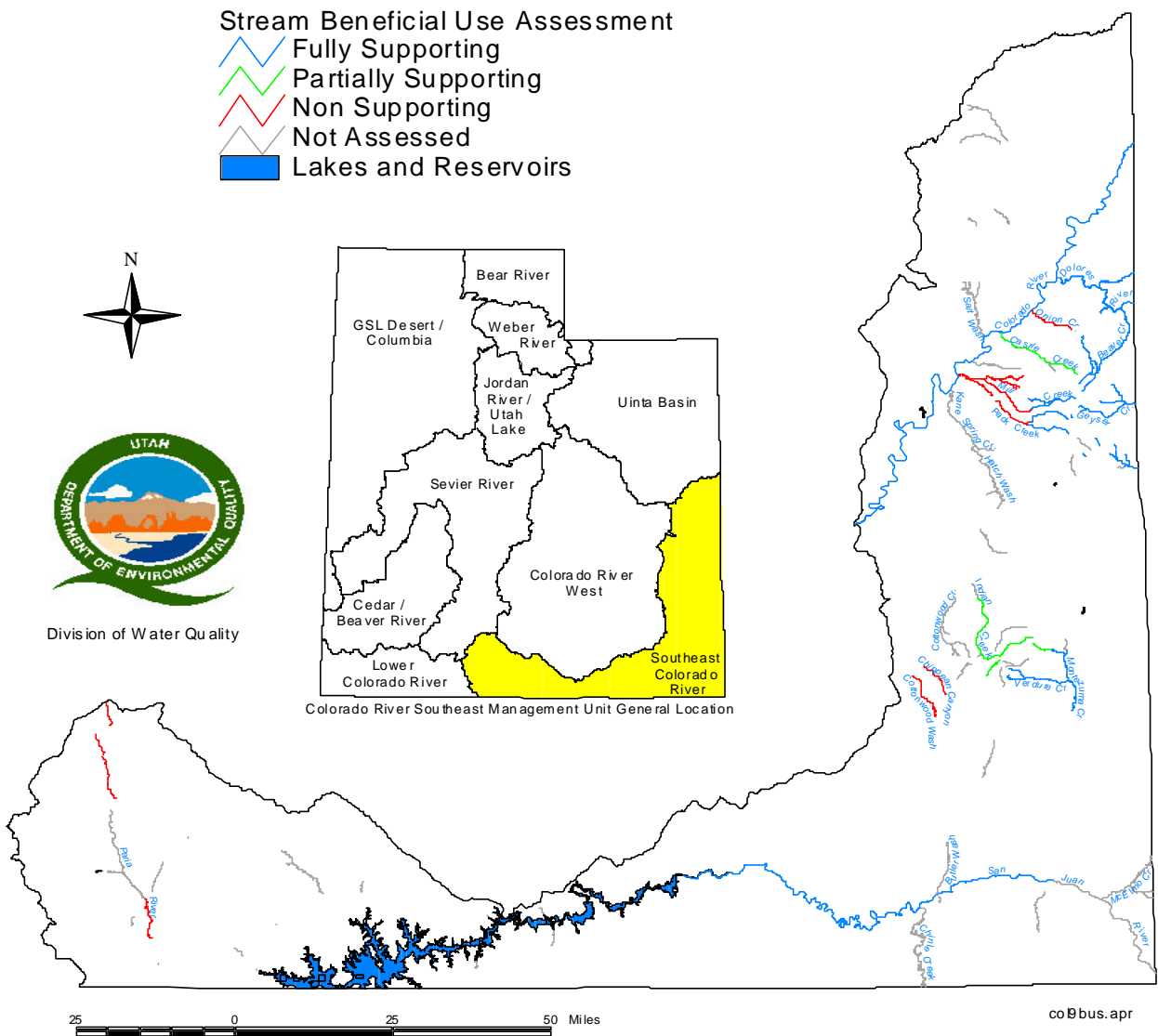


**Figure 3. Southeast Colorado Watershed Management Unit waterbodies and sampling sites.**



# SOUTHEAST COLORADO WATERSHED MANAGEMENT UNIT STREAM BENEFICIAL USE SUPPORT

## Southeast Colorado Beneficial Use Support



**Figure 4. Southeast Colorado Watershed Management Unit beneficial use support map.**



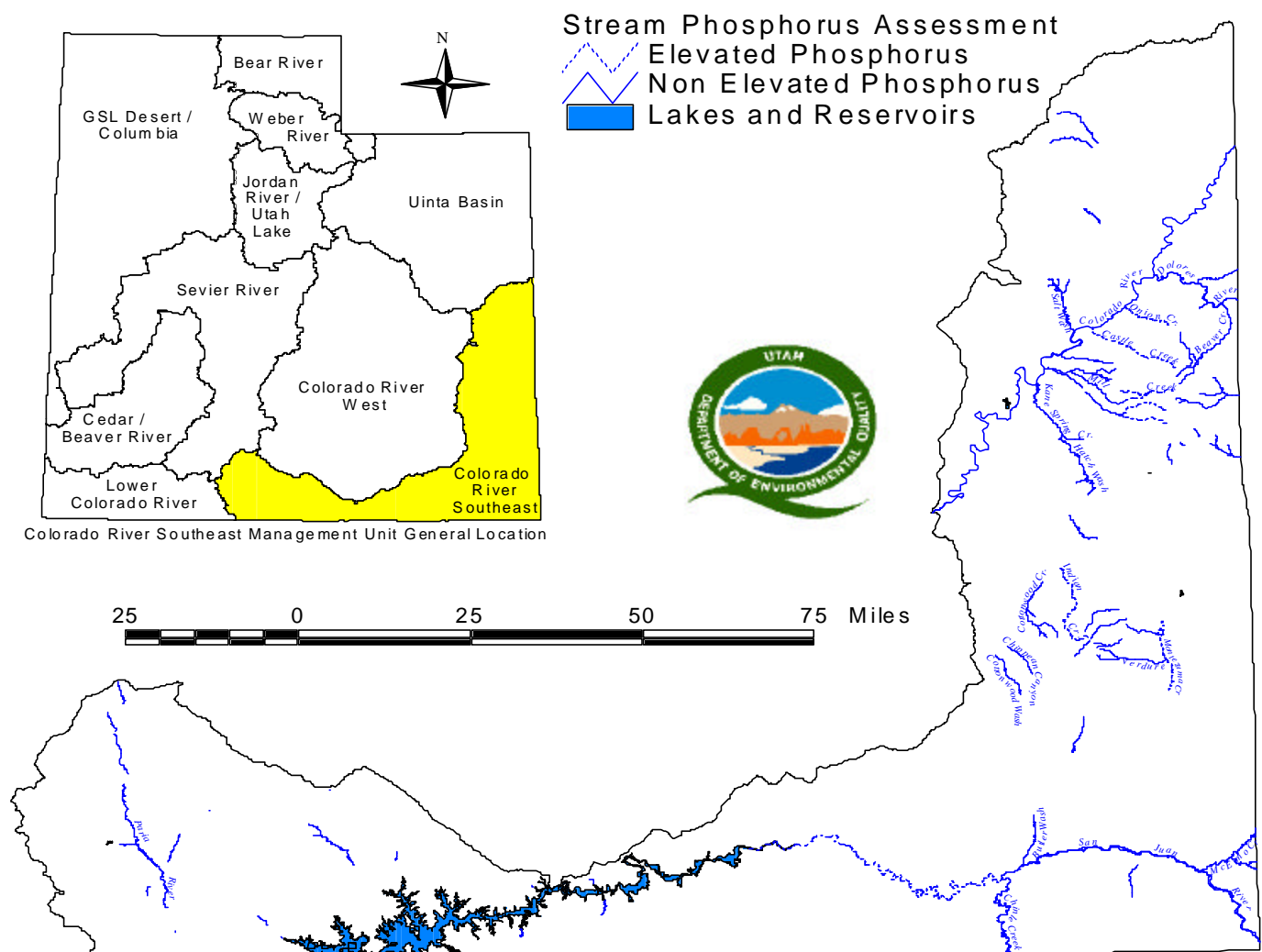
**Table 4. List of Impaired Waterbodies in the Southeast Colorado River Watershed Management Unit.**

				Beneficial		Beneficial	Cause	Impact		Impact
WB	Waterbody	Waterbody		Use	Stream	Use	of	of	Probable Source	of
No.	Name	Description	HUC	Class	Miles	Support	Impairment	Cause	of Impairment	Source
1	Paria River-1	Paria River from start of Paria River Gorge to headwaters	14070007	4	18.4	NS	Total Dissolved Solids	Major	Agriculture	Moderate
1	Paria River-1	Paria River from start of Paria River Gorge to headwaters	14070007	4	18.4	NS	Total Dissolved Solids	Major	Natural	Moderate
5	Paria River-3	Paria River from Utah/Arizona stateline to Cottonwood Wash	14070007	4	18.4	NS	Total Dissolved Solids	Major	Natural	Major
24	Cottonwood Wash-3	Cottonwood Wash & tribs withing U.S.F.S. boundary	14080201	1C	11.6	NS	Gross Alpha	Major	Resource Extraction	Major
25	Cottonwood Wash-2	Cottonwood Wash from Westwater confluence to U.S.F.S. boundary	14080201	1C	5.52	NS	Gross Alpha	Major	Resource Extraction	Major
27	Johnson Creek	Johnson Creek & tribs from confluence with Recapture Creek to headwaters	14080201	3	3.9	PS	pH	Moderate	Unknown	Moderate
43	Indian Creek-2	Indian Creek from Newspaper Rock north boundary to headwaters	14030005	3	15.8	PS	pH	Moderate	Unknown	Moderate
49	Mill Creek-1	Mill Creek & tribs from confluence with Colorado River to U.S.F.S. boundary	14030005	4	56.9	NS	Total Dissolved Solids	Moderate	Agriculture	Moderate
49	Mill Creek-1	Mill Creek & tribs from confluence with Colorado River to U.S.F.S. boundary	14030005	4	56.9	NS	Total Dissolved Solids	Moderate	Natural	Moderate
49	Mill Creek-1	Mill Creek & tribs from confluence with Colorado River to U.S.F.S. boundary	14030005	3	56.9	NS	Temperature	Moderate	Unknown	Moderate
54	Castle Creek	Castle Creek & tribs from confluence with Colorado River to headwaters	14030005	4	11.9	PS	Total Dissolved Solids	Moderate	Agriculture	Moderate
54	Castle Creek	Castle Creek & tribs from confluence with Colorado River to headwaters	14030005	4	11.9	PS	Total Dissolved Solids	Moderate	Natural	Moderate
55	Onion Creek	Onion Creek & tribs from confluence with Colorado River to headwaters	14030005	4	10.2	NS	Total Dissolved Solids	Major	Agriculture	Moderate
55	Onion Creek	Onion Creek & tribs from confluence with Colorado River to headwaters	14030005	4	10.2	NS	Total Dissolved Solids	Major	Natural	Moderate
55	Onion Creek	Onion Creek & tribs from confluence with Colorado River to headwaters	14030005	3	10.2	PS	Temperature	Moderate	Unknown	Moderate
71	North Creek	North Creek & tribs from confluence w/Montezuma Creek to headwaters	14080203	3	12.7	PS	pH	Moderate	Unknown	Moderate

**Table 5. Waterbodies in Southeast Watershed Management Unit With Elevated Levels of Phosphorus**

<b>Waterbody</b>	<b>Waterbody</b>	<b>Waterbody</b>		<b>Stream</b>
<b>Number</b>	<b>Name</b>	<b>Description</b>	<b>HUC</b>	<b>Miles</b>
18	San Juan River-1	San Juan River from Lake Powell upstream to HUC boundary (14080201)	14080205	63.73
36	Montezuma Creek-2	Montezuma Creek-2.Montezuma Creek & tribs from Verdure Creek confluence to U.S. 191	14080203	13.42
43	Indian Creek-2	Indian Creek from Newspaper Rock north boundary to headwaters	14030005	15.77
50	Mill Creek-2	Mill Creek & tribs from U.S.F.S. boundary to headwaters	14030005	25.26
54	Castle Creek	Castle Creek & tribs from confluence with Colorado River to headwaters	14030005	11.88
55	Onion Creek	Onion Creek & tribs from confluence with Colorado River to headwaters	14030005	10.17

# SOUTHEASTERN WATERSHED MANAGEMENT UNIT WATERS WITH ELEVATED LEVELS OF PHOSPHORUS



**Figure 7. Southeast Colorado Watershed Management Unit waterbodies with elevated levels of phosphorus.**

Table 6. Total Waters Impaired by Various Cause Categories Southeast Colorado Watershed Management Unit Streams.		
Cause Category	Contribution to Impairments	
	Major	Moderate/Minor
Cause unknown	0.0	0.0
Unknown toxicity	0.0	0.0
Pesticides	-	-
Priority organics	-	-
Nonpriority organics	-	-
Metals	0.0	0.0
Ammonia	0.0	0.0
Chlorine	0.0	0.0
Other inorganics	0.0	0.0
Nutrients	0.0	0.0
pH	0.0	32.4
Siltation/Sediments	0.0	0.0
Organic enrichment/low DO	0.0	0.0
Salinity/TDS/Chlorides	40.7	68.8
Thermal modifications	0.0	47.9
Flow alterations	0.0	0.0
Other habitat alterations	0.0	0.0
Pathogen Indicators	-	-
Radiation	17.1	0.0
Oil and grease	-	-
Taste and odor	0.0	0.0
Noxious aquatic plants	0.0	0.0
Total toxics	-	-
Turbidity	-	-
Exotic Species	-	-

\* = Category not applicable.

- = Category applicable, no data available.

0 = Category applicable, but size of waters in the category is zero.

Note: **Major** category is now used only for waters found not supporting.

Table 7. Total Waters Impaired by Various Source Categories Southeast Colorado Watershed Management Unit Streams.		
Source Category	Contribution to Impairments	
	Major	Moderate/Minor
Industrial Point Sources	0.0	0.0
Municipal Point Sources	0.0	0.0
Combined Sewer Overflow	0.0	0.0
Agriculture	0.0	97.3
Silviculture	-	-
Construction	-	0.0
Urban Runoff/Storm Sewers		
Resource Extraction	17.1	0.0
Land Disposal	-	0.0
Hydromodification	0.0	0.0
Habitat Modification	0.0	0.0
Marinas	*	*
Atmospheric Deposition	-	-
Contaminated Sediments	-	-
Unknown Source	0.0	99.5
Natural Sources	0.0	97.3
Reservoir Releases	0.0	0.0
Recreation	0.0	0.0
Aquaculture	0.0	0.0

\* = Category not applicable.

- = Category applicable, no data available.

0 = Category applicable, but size of waters in the category is zero.

Note: **Major** category is now used only for waters found not supporting.

## *Percent of Stream Miles Affected By Causes 2000 305(b) Assessment*

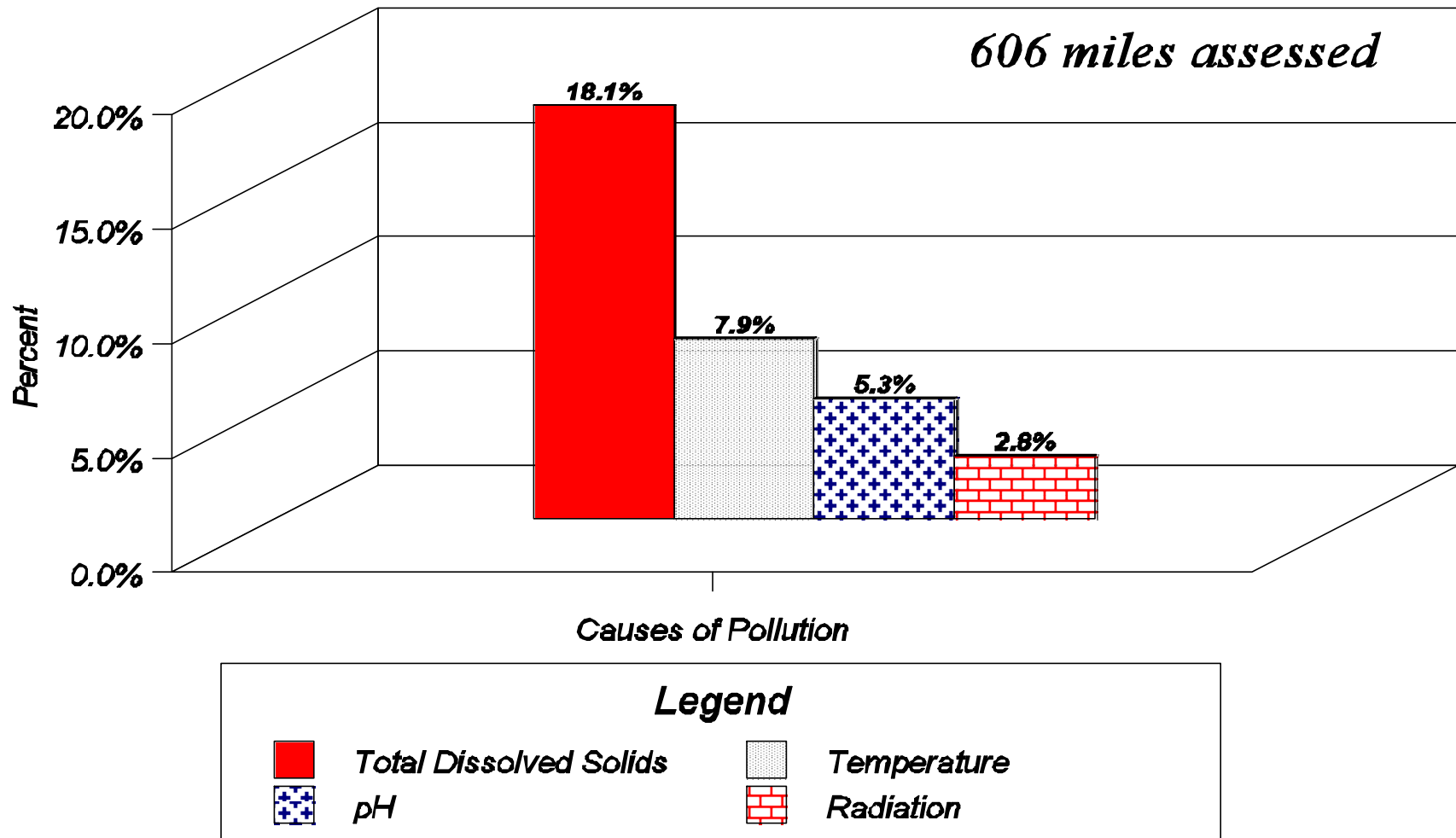


Figure 6. Percent of stream miles affected by various causes - 2000 305(b).



# ***Percent of Stream Miles Affected By Causes***

## ***Southeast Colorado Watershed Management Unit***

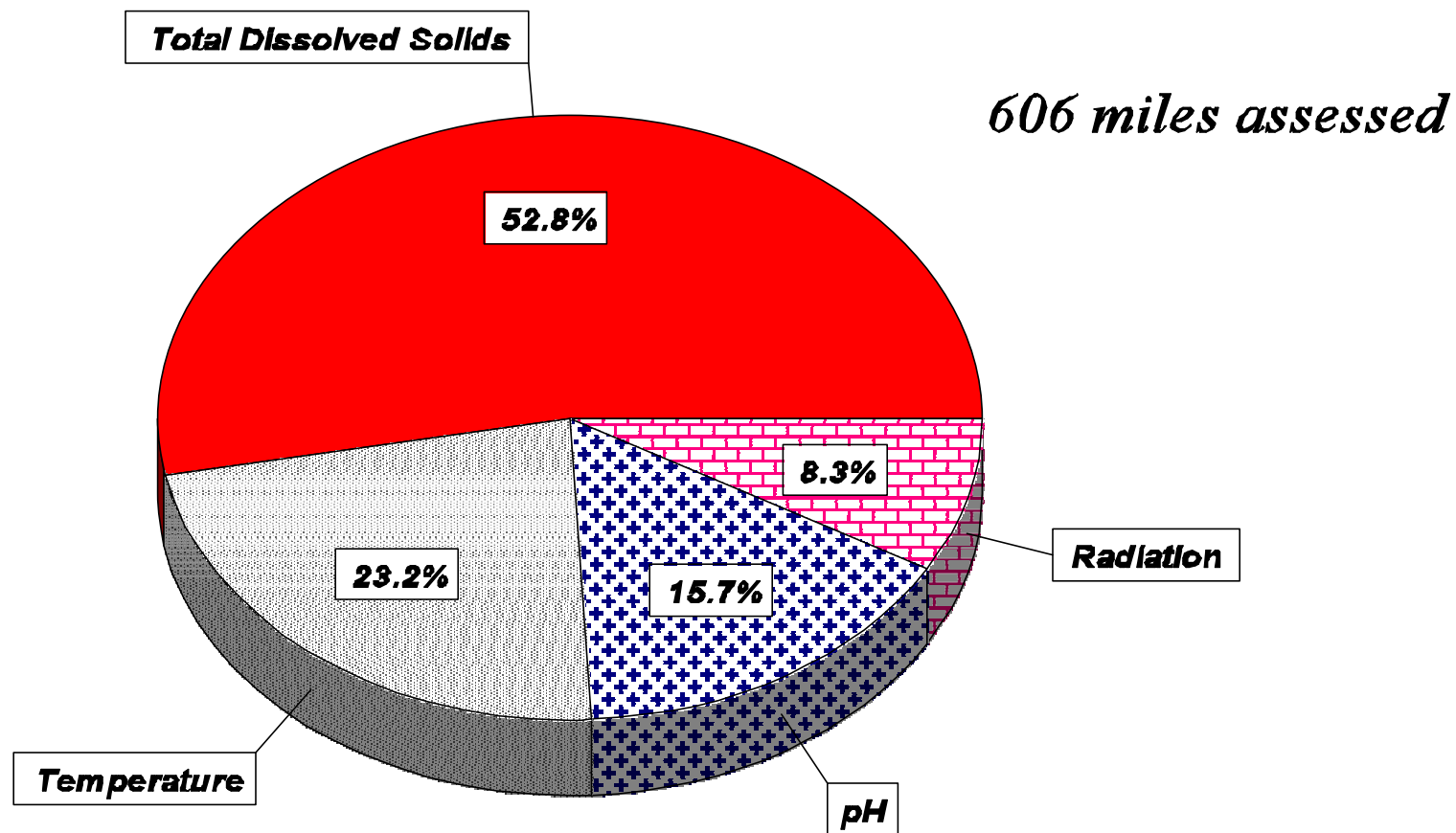


Figure 7. Relative percent impact by causes - 2000 305(b).

## Percent of Stream Miles Affected By Sources

*Southeast Colorado Watershed Management Unit*

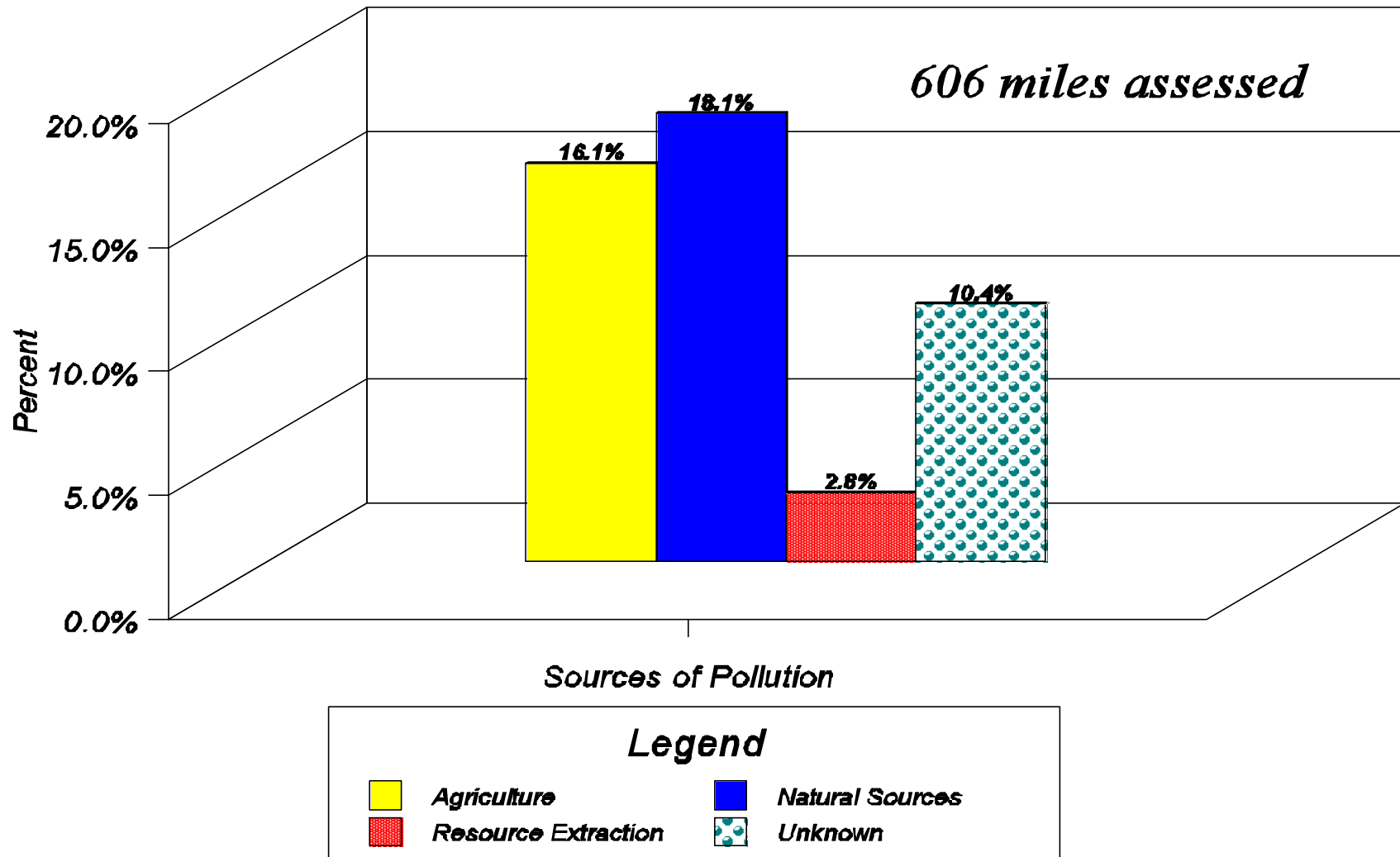


Figure 8. Percent miles effected by various sources - 2000 305(b).

# ***Sources of Stream Water Quality Impairment Southeast Colorado Management Unit***

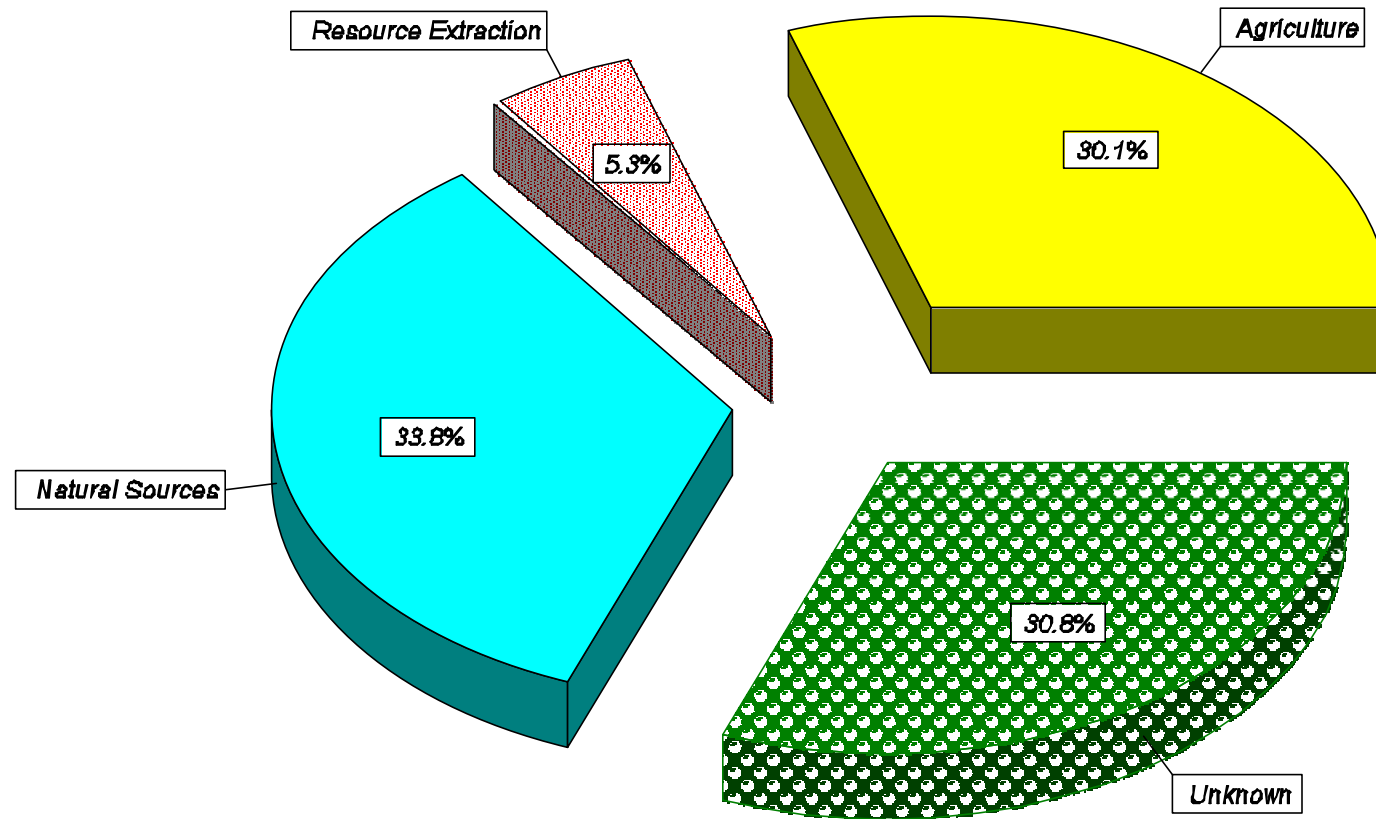


Figure 9. Relative percent impact by sources on stream water quality - 2000 305(b).

## REFERENCES

Division of Water Quality. 1999. Standards of quality for waters of the State, R317-2, Utah Administrative Code, Utah Division of Water Quality, Utah Department of Environmental quality, Salt Lake City, UT.

Division of Water Quality. 1993. Quality assurance and standard operating procedures manual. Utah Division of Water Quality, Utah Department of Environmental quality, Salt Lake City, UT.



## APPENDIX

### Methods for Determining Beneficial Use Support

Tables 1 through 4 are the criteria used to compare data against standards and pollution indicators found in *Standards of Quality for Waters of the State, R317-2, Utah Administrative Code* to determine beneficial use support of waterbodies. The State of Utah exercises discretion in using data on that goes beyond the criteria listed in the following tables and/or narrative for determining beneficial use support and can include other types of information and best professional judgement.

**Table A-1. Criteria for Assessing Water as a Source of Drinking Water-Class 1C**

Degree of Use Support	Field Monitoring (Toxicants)	Restrictions
Full	For any one pollutant, no more than one violation of criterion.	No source water closures or advisories
Partial	For any one pollutant, two or more violations of the criterion, but violations occurred in #10% of the samples.	One or more drinking water source advisories lasting less than 30 days per year.
Non	For any one pollutant, two or more violations of the criterion, and violations occurred in more than 10% of the samples.	One or more drinking water source advisories lasting greater than 30 days.

**Table A-2. Criteria for Assessing Primary and Secondary Contact Beneficial Use - Class 2A and 2B**

Degree of Use Support	Restrictions	Fecal Coliform Bacteria
Full	No bathing area closures or restrictions in effect during reporting period.	Criterion 1 and Criterion 2 met.
Partial	On average, one bathing area closure per year of less than one week's duration.	Geometric mean met; not more than 25 percent of samples exceed 400 per 100 ml.
Non	On average, one bathing area closure per year of greater than one week's duration, or more than one bathing area closure per year.	Neither geometric mean nor maximum criteria limits achieved.

#### **Bacterial Criterion**

**Criterion 1** = The geometric mean of the fecal coliform bacteria level should not exceed 200 per 100 mL for any 30-day period.

**Criterion 2**= Not more than 10 percent of the total samples taken during any 30 day period should have a density that exceeds 400 per 100 mL.

**Table A-3. Criteria for Assessing Aquatic Life Beneficial Support-Classes 3A, 3B, 3C, 3D**

Degree of Use Support	Conventional Parameters (pH, DO, Temperature)	Toxic Parameters (priority pollutants, chlorine, and ammonia)
Full	For any one pollutant, no more than one exceedance of criterion or criterion was not exceeded in < 10% of the samples if there were two or more exceedances.	For any one pollutant, no more than one violation of acute criteria.
Partial	For any one pollutant, criterion was exceeded two times, and criterion was exceeded in more than 10% but not more than 25% of the samples.	For any one pollutant, two or more violations of the acute criterion, but violations occurred in #10% of the samples.
Non	For any one pollutant, criterion was exceeded two times, and criterion was exceeded in more than 25% of the samples.	For any one pollutant, two or more violations of the acute criterion, and violations occurred in more than 10% of the samples.

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**Total Phosphorus Assessment**

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For **total phosphorus** , the following criteria were used to identify waters as ‘**needing further evaluation**’.

If the **pollution indicator value** for total phosphorus (**0.05 mg/L**) was exceeded in more than 10% of the samples, and the mean of all samples was > **0.06 mg/L** the waterbody was identified as ‘needing further evaluation or study’ before a decision to list a stream waterbody on the 303(d) list. Additional evaluations could include benthic macroinvertebrate data, diurnal dissolved oxygen data, habitat quality evaluations, and fisheries data. Reports published or information collected by other entities can be used to determine beneficial use support.

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**Table A-4. Criteria for Assessing Agricultural Beneficial Use Support - Class 4**

<b>Degree of Use Support</b>	<b>Conventional Parameter (Total Dissolved Solids)</b>	<b>Toxic Parameters</b>
Full	Criterion exceeded in less than two samples and in < 10% of the samples if there were two or more exceedances.	For any one pollutant, no more than one violation of criterion.
Partial	Criterion was exceeded two times, and criterion was exceeded in more than 10% but not more than 25% of the samples.	For any one pollutant, two or more violations of the criterion, but violations occurred in #10% of the samples.
Non	Criterion was exceeded two times, and criterion was exceeded in more than 25% of the samples.	For any one pollutant, two or more violations of the criterion, and violations occurred in more than 10% of the samples.